Technical Memorandum
Comments on the Updated Screening Level Ecological Risk Assessment

Gulfco Marine Maintenance Company
Freeport, Brazoria County, Texas
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Prepared for

U.S. Environmental Protection Agency
Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

Prepared by

EA Engineering, Science, and Technology, Inc.
405 S. Highway 121
Building C, Suite 100
Lewisville, Texas 75067
(972) 315-3922

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1.0 INTRODUCTION

This Technical Memorandum summarizes EA Engineering, Science, and Technology, Inc.'s technical review comments for the Updated Screening Level Ecological Risk Assessment (SLERA) prepared by Pastor, Behling & Wheeler, LLC (PBW) for the Gulfco Marine Maintenance Superfund Site (site), located in Freeport, Texas, and submitted to the U.S. Environmental Protection Agency (EPA) on 22 December 2009. The technical review was conducted to assure that the Updated SLERA complies with guidance, and focused on adequacy of the preparer's responses to EPA comments (dated 4 December 2009) and compliance with requested changes through revision.

General technical review comments pertaining to the Updated SLERA are provided in Section 2.0. Specific technical review comments associated with the body of the Updated SLERA, including the tables and figures, are provided in Section 3.0. Section 4.0 provides a summary based on the outcome of the technical review.

2.0 GENERAL TECHNICAL REVIEW COMMENTS

Based upon EA's review, the document provided updated calculations and conclusions, provided necessary clarifications, and revised the risk assessment approach as requested in previous EPA comments dated 4 December 2009. Review of exposure calculations and use of benchmarks indicates that they complied with EPA requests to modify specific measurement endpoints and subsequent risk assessment conclusions.

3.0 SPECIFIC TECHNICAL REVIEW COMMENTS

The following technical review comments (Specific Comments 1 through 3) are associated with the body of the Updated SLERA, including the tables and figures.

1. **Table 19**

   In Table 19, the text under "Testable Hypotheses for SLERA" requires additional revision with respect to avian predators. The text currently reads "...concentrations do not exceed screening criteria." It should be changed to read "...intake levels do not exceed TRVs."

2. **Section 5.0**

   EPA General Comment 12 requests that discussions of the conclusions of the document be revised to refer to guilds rather than specific receptor species. Several portions of Section 5.0 require additional revision where species rather than guilds are discussed.

3. EPA Specific Comment 9

EPA Specific Comment 9, relating to Page 31, Section 3.4.8 Surface Water, identifies three metals (mercury, selenium, and thallium) detected in surface water that are potentially bioaccumulative. The comment requests that these metals be maintained for further evaluation in food chain models. The response to this comment indicates that a path forward is unclear because, while these metals are bioaccumulative, and it would be consistent to maintain them, food web bioaccumulation from surface water was not quantified as part of models. The response also states that water quality criteria (WQC) presumably factor in food chain bioaccumulation.

The following information is being provided to aid in determining a path forward for these chemicals. WQC typically do not factor in food web bioaccumulation; they are typically based on acute or chronic exposures for aquatic/benthic organisms, and as such, do not consider transfer to higher trophic levels. Thus, WQC do not provide effective screening criteria for eliminating these three metals from food chain modeling. It is possible to carry these metals forward and use literature-based bioconcentration factors (BCFs) to estimate aquatic prey item tissue concentrations based on surface water concentrations of metals. However, the SLERA uses a more conservative/precautionary approach by estimating aquatic prey item tissue concentrations using biota-sediment accumulation factors (BSAFs) that assume accumulation from sediment. This is generally considered more precautionary and appropriate, as sediments provide a long term, more consistent and site-related source of chemicals to benthic prey than surface water, where concentrations may vary due to off-site inputs. Thus, the food web models for avian predators already quantify bioaccumulation of mercury into prey items using BSAFs. Selenium and thallium were not detected in sediment; therefore, they were not carried into food web models. It is uncertain whether bioaccumulation of selenium and thallium from surface water into prey items would be significant enough to warrant separate quantification.

4.0 SUMMARY

In summary:

1. Based upon EA's review, the Updated SLERA has undergone revision in response to EPA comments dated 4 December 2009.

2. On Table 19, the text under "Testable Hypotheses for SLERA" should be revised for avian predators to indicate intake levels do not exceed TRVs.

3. Per EPA General Comment 12, several portions of Section 5.0 require additional revision where species rather than guilds are discussed.

4. Additional information has been provided in order to determine a path forward for mercury, selenium, and thallium in surface water.

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